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U.S. Policy on Energy Access

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USAWC STRATEGY RESEARCH PROJECT

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Abstract

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Forty years ago, the United States discovered the consequences of relying on foreign oil during the OPEC oil embargo. Initially, the U.S. pursued policies to mitigate the impact of the embargo and reduce future reliance on foreign oil through conservation and domestic energy. Until recently, expanding U.S. energy access was inconsistent. During the last 10 years, there is renewed interest and growth in domestic energy access supported by government and industry. The United States must implement a strategy to maintain this momentum.

U.S. Policy on Energy Access

The U.S. efforts to address energy access are directly proportional to the crisis of the day. If energy access is not causing an immediate problem, efforts to broaden domestic energy stagnate. Hurricane Sandy provides a current day example of the necessity to aggressively pursue broader energy access before a crisis occurs. In the aftermath of the storm, daily life in the most heavily populated cities in the Northeast United States was dramatically changed from work-related activities to basic survival, due primarily to property damage and lack of power. For those areas that were not underwater (for example, Newark, New Jersey and Staten Island, New York), portable energy sources and more fuel were required, but not readily available. As a result, citizens suffered unnecessary hardship without unfettered access to energy. Unfortunately, the United States continues to rely on other countries for energy. This is almost the equivalent of relying on other countries for food and water. Energy is not a physiological necessity like food and water, but is very close considering life without energy.

The U.S. Energy Information Administration *Annual Energy Outlook 2012 Report* projects steady increases in oil prices through 2035. The price per barrel of oil varies significantly ($98 to $145 per barrel in 2035) based on market volatility and economic conditions.[1] The uncertainty of oil prices and access to oil, highlighted over three decades ago during the 1973 Organization of Petroleum Exporting Countries (OPEC) oil embargo, can adversely affect the American economy. The visible examples of the importance of energy in the aftermath of Hurricane Sandy and the projections of steady increases in oil prices confirm that energy access remains a threat to the American way of life. Actions to address energy access during the last three decades were

inconsistent; however, government-led efforts have contributed to recent growth in domestic energy access. This paper will review examples highlighting the importance and effects of energy access, examine current interest in energy, outline options to address energy access, and provide a recommendation to improve energy access.

The Growing Importance of Energy Access

The United States and other modern societies developed a need for energy access to not only sustain their way of life, but also to improve it. Fossil fuel became a critical element in the production and distribution of basic necessities such as food and water. Access to energy has supported technological developments that create new businesses (e.g., aeronautic, automotive, and transportation) and improve standards of living (e.g., home heating, cooling, lighting, and food storage). Additionally, one of the key elements of national power, the U.S. military, is dependent on energy. The societal requirements for fossil fuel contributed to America's dependency on foreign oil.

History is replete with examples of energy dependency and the resulting vulnerability when energy access is limited. The U.S. and global reliance on energy, specifically fossil fuel, began long ago. Throughout recent history, there are examples of the growing importance of energy. However, problems with energy access did not become an issue until the latter part of the 20th century. Over one hundred years ago, the long road to oil dependency began in 1859 when Edwin L. Drake drilled the first U.S. oil well near Titusville, Pennsylvania.[2] Advances in manufacturing, transportation, and utility services eventually increased the need for fossil fuel.

An early example of the importance of fossil fuel occurred in Europe. In 1912, the British Royal Navy began converting from coal to oil and relied on the oil fields in the Persian Gulf to fuel the British Navy.[3] This decision, supported by Winston Churchill,

was based on the advantages of oil over coal. Oil was stored and transported more efficiently and possessed a higher thermal content than coal. As a result, ships required less storage capacity for oil which facilitated more efficient ship designs and faster vessels. Naval leadership initially opposed Churchill's idea because the oil did not exist in England, while coal did. Later, convinced that their German adversaries were also pursuing oil burning ships, British leadership pursued the development of oil burning ships and relied on the Persian Gulf for fuel.[4] This was one of the first signs of national level dependence on foreign energy.

This dependency was exacerbated as the world engaged in conflict. During World War II, the need for petroleum became a critical issue and influenced Nazi strategy. According to the *Journal of Military History*, Hitler told his senior officers of Army Group South that without petroleum from oil rich areas in Russia the war would end for Germany.[5] Hitler's offensive against the Soviet Union, though unsuccessful, included the capture of the Caspian oil fields as a primary objective. Hitler acknowledged that Germany was "petroleum poor" and required fuel to keep his military operational.[6]

The allies were also affected by fuel shortages during World War II. The need for fuel slowed General Patton's advance to the heart of Germany. When General Eisenhower developed plans to continue the allied advance in Germany, he considered the availability of fuel before assigning missions to Generals Montgomery and Patton. [7] The relevance of energy access to conduct military operations continued after World War II and contributed to the growing energy demand that would empower major oil producing nations.

Following World War II, Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela formed OPEC in 1960 to " … co-ordinate and unify petroleum policies among member countries, in order to secure fair and stable prices for petroleum producers; an efficient, economic and regular supply of petroleum to consuming nations; and a fair return on capital to those investing in the industry."[8] OPEC recognized the importance of oil to consumer nations and wanted to avoid exploitation, thus causing a potential problem for oil dependent non-OPEC nations.

Despite the creation of OPEC, there was no indication of barriers to American access to oil. Domestic energy production provided over 90 percent of the energy for the U.S.[9] Energy consumption compared to access did not cause an immediate concern. Therefore, no agency in the U.S. government was responsible for projecting future consumption, production, and remaining domestic energy capacity. This oversight, perhaps based on over confidence, would change in the '70s. The concerns of British military leaders in 1912 regarding the reliance on foreign oil for the Royal Navy would be validated 61 years later by the actions of OPEC.

By 1970, U.S. consumption exceeded production and America became a net oil importer as fossil fuel production in Texas began to decline.[10] In October 1973, Egypt and Syria attacked Israel. The United States support to Israel of $2 billion in arms and aid would have a direct impact on the U.S. economy. The Organization of Petroleum Exporting Countries responded to U.S. aid to Israel by halting oil shipments to the United States in October 1973. The OPEC embargo was an economic attack against the United States for supporting Israel during the Yom Kippur War.[11] The unresolved Arab-Israeli conflict provided an opportunity for OPEC to exercise its power against the

west. Within six months of OPEC's embargo, oil prices quadrupled.[12] Americans were faced with the reality of gas rationing because of the actions of foreign suppliers of oil. The use of fossil fuels was prioritized by the federal government to ensure fuel was available to heat homes. The expectation of open access to fuel was no longer valid. This was the first time in recent history that a foreign country effectively attacked the U.S. economy, highlighting the importance of energy in modern society and the consequence of relying on foreign suppliers. The oil embargo required Presidential-level action to resolve national energy access problems through domestic energy production.

From April to October 1973, before the OPEC oil embargo, recognizing the growing importance of energy, President Nixon conducted a series of meetings to address vital energy needs. He focused on energy conservation and investment in research for alternative energy. Six months after President Nixon began his meetings on energy requirements, the OPEC oil embargo his validated concerns. He addressed the nation on 7 November 1973 to discuss the pending energy shortages. He began the speech by describing the energy shortage as a serious national problem and concluded the speech by challenging the nation to become energy independent by 1980.[13] President Nixon addressed the nation again 3 weeks later to discuss additional steps in the national energy policy. The immediate steps involved conservation and changes to energy production. Reductions in gasoline sales, speed limits, jet fuel consumption, and outdoor lighting were examples of conservation initiatives to save over one hundred thousand barrels of oil a day.[14]

The OPEC embargo set the stage for national policy and creative ideas to address energy access. The Federal Lands Right-of-Way Act was one of the first

national policies, a landmark decision authorizing the construction of the Alaska pipeline to increase domestic oil production.[15] The National Aeronautics and Space Administration (NASA) led efforts working with industry to pursue renewable energy in wind turbines. These first steps slowly set the foundation for expanding energy access and required government leadership, industry, and consumer involvement to achieve success.

President Ford continued President Nixon's efforts for energy independence. During an address to the nation on 13 January 1975, President Ford stated that Americans were not in full control of their national destiny as long as there was uncertainty in foreign fuel availability and pricing. In an attempt to address this ongoing issue through domestic energy policies, he signed the Energy Policy and Conservation Act in 1975.[16] The act provided funding and authorities to execute national energy policies. The Federal Government guaranteed loans up to $30 million for underground coal development. The Federal Energy Administration received extended authority to order power plants and major consumers to burn coal rather than natural gas or petroleum products. The President had the authority to restrict exports of energy, if necessary, to protect domestic supplies. Efficiency standards were imposed for consumer goods (for example automobiles and appliances) and industry.

There were additional provisions in the act, but the most noteworthy was the establishment of the Strategic Petroleum Reserve (SPR). The SPR provided a short term supply of oil to offset future fuel shortages and ensured access to energy supplies on American soil. Recognizing the importance of energy access to support the U.S. way of life, President Ford sought an American solution for energy and like his predecessor

set a goal for energy independence by 1985.[17] The goal was not met, but government leadership moved the nation closer to solving energy access.

President Carter's energy policies continued the focus on conservation and renewable energy. Shortly after his inauguration, President Carter's address to the nation categorized energy supplies as limited and a crisis condition. Within the first year of his presidency, he was faced with a natural gas shortage facilitated by regulation which limited interstate transport of natural gas, further adding to the U.S. energy shortage. President Carter focused on conservation and domestic energy to address the U.S. energy shortage.[18]

Conservation required a change in the culture of using energy. During one of his speeches, President Carter stated that discovering new sources of energy and rationing would have limited success without conservation. Domestic production of energy was well below consumption requirements with no projected change in that relationship.[19] President Carter accurately identified conservation as a feasible short term solution to reduce the gap between consumption and domestic energy production. Like his predecessors, President Carter envisioned increased domestic energy production as the primary solution to the American energy crisis. The United States required time to resolve its energy access problem, but government energy conservation policies contributed to curbing energy consumption.[20]

From 1980 through 1983, energy consumption dropped at a steady rate, domestic production remained steady, and net imports declined.[21] As a result, President Reagan did not consider U.S. energy access a crisis. He promoted an energy policy that relied on consumers and the free market to balance supply and demand for energy

needs and directed that government not impede the market.[22] With domestic fossil fuel production at a steady state and a decline in consumption and net imports, there was limited government led effort or incentives to aggressively pursue energy access solutions for the United States.

By 1984, energy consumption and net imports began to increase while domestic production began to decline. The trend with energy consumption and net imports continued through 2007. Domestic energy production showed small growth through 2007, but not enough to affect net imports.[23] Recognizing the unfavorable trend with energy consumption and production, the federal government increased efforts to resolve the energy issue through executive orders authorizing energy projects.[24] By 2008, domestic energy production began to increase and net imports began to decline.[25] Government-led efforts, reminiscent of government commitment after the 1973 oil embargo, were making a difference.

In addition to domestic production, energy analysts highlight the shortage in U.S. refineries as an energy access issue. Refinery output can affect the availability of fuel, thereby affecting energy access. When addressing the issue with refineries, two broad reasons have developed explaining the cause of the refinery shortage. Some energy analysts claim that U.S. regulations are hindering the construction of more refineries.[26] Others claim that large oil corporations are preventing smaller companies from competing in the refinery market.[27] Each argument warrants investigation, but neither solves the broader issue of expanding domestic energy.

In the article “Culture, Institutions, and Defence Cuts: Overcoming Challenges in Operational Energy Security,” John R. Deni describes American interest in energy as

sporadic and driven by changes in the international energy system.[28] The policies enacted by each President and the limited progress toward domestic energy access highlights inconsistent commitment by the United States since 1973.

Renewed Interest in Energy Access

Three decades after the OPEC oil embargo, there is renewed interest in energy access. The United States has made progress in diversifying the sources of oil imports (see table 1 below).[29]

Table 1:

Crude Oil Imports (Top 15 Countries - thousand barrels per day)

Country	Dec-12	Nov-12	Dec-11
CANADA	2,502	2,252	2,431
VENEZUELA	1,054	1,032	810
SAUDI ARABIA	1,030	1,319	1,293
MEXICO	954	1,014	945
IRAQ	462	489	380
COLOMBIA	348	436	458
KUWAIT	254	276	231
NIGERIA	230	485	498
ECUADOR	150	136	106
ANGOLA	116	145	357
ALGERIA	107	85	141
CHAD	92	64	46
BRAZIL	49	52	389
EQUATORIAL GUINEA	35	20	0
AZERBAIJAN	34	0	34

Government policies are facilitating domestic energy solutions. The military and individual states are leading the way in expanding domestic energy access. For

example, the Department of Defense (DoD) is considered the nation's largest consumer of energy.[30] The 2011 energy bill for DoD was over $19 billion. Operational energy comprised $15 billion of DoD's $19 billion bill.[31] This includes energy for training, moving, and sustaining military forces and weapon systems for operations.[32] It is virtually impossible to conduct a military operation in support of national interests without using energy. Government directives for efficiency and the necessity of energy access for military operations led to the DoD Operational Energy Strategy. The strategy addresses three goals to confront operational energy challenges:

- Reduce the demand for energy in military operations by improving the efficiency of military energy use
- Expand and diversify energy sources and secure energy access for military operations
- Build energy security into the future force[33]

The goals above are achievable with the continuing developments in the energy sector. The Department of Defense is leveraging technology and applying it to mission requirements. Listed below are several examples of military projects leveraging accomplishments in energy access to meet DoD operational energy goals:

- The Army and Marines are increasing energy efficiency and reducing fuel usage in base camps through alternate energy sources
- The Navy's "Great Green Fleet," a carrier strike group using nuclear power and biofuels
- The Air Force is testing blends of biofuels and more efficient engines[34]

Facility energy, which includes power for fixed installations and non-tactical vehicles, accounted for the remainder of DoD's 2011 energy bill of $4 billion.[35] The Department of Defense recognizes the importance of energy not only for the cost, but

also for its utility. The Department of Defense has relied on installations to support operations as staging platforms for humanitarian and homeland defense missions and combat operations. To continue to support missions and mitigate the risks of reduced energy access, the DoD has developed a facility energy strategy with four inter-related elements:

- Reduce the demand for traditional energy through conservation and energy efficiency
- Expand the supply of renewable energy and other forms of distributed energy
- Enhance the energy security of DoD installations directly (as well as indirectly, through the first two elements)
- Leverage advanced technology[36]

Military services and Defense agencies are committed to achieving success in DoD's facility energy strategy. The accomplishments are gradual, but the trend is consistent and proof that the strategy is achievable. Listed below are several facility energy accomplishments by the military services and defense agencies:

- Energy use per gross square foot of facility area declined by 13 percent from 2003 to 2007 in buildings subject to energy reduction requirements [37]
- Petroleum consumption dropped by approximately 12 percent from 2005 to 2011 (85 million to 75 million gallons of petroleum)[38]
- Total production and procurement of renewable energy in 2011 was 8.5 percent of the total facility electricity consumption[39]

Government policies directing efforts to improve energy efficiency and pursue domestic energy contributed to the energy accomplishments in DoD. The United States must continue government-led efforts to maintain progress.

Like the DoD, many states recognize the necessity of reducing their energy vulnerability and are leveraging advances in domestic energy to broaden their energy access. In 2001, five states produced approximately 5 – 15 percent of their total net energy generation from non-hydroelectric renewable sources. The remaining states produced less than 4 percent of their total net energy generation from non-hydroelectric renewable sources. Ten years later, in 2011, twenty states produced approximately 5 – 15 percent of their total net energy generation from non-hydroelectric renewable sources. Twenty-six states produced approximately 1 – 4 percent and the remaining states produced less than 1 percent of their total net energy generation from non-hydroelectric renewable sources.[40]

This steady trend in alternate energy usage is the result of practical application of technology. Oregon's Caithness Shepherds Flat wind farm, a private and public sector investment, is one of the world's largest wind farms. The wind turbines at Shepherd's Flat can generate 845 megawatts of power, providing power to approximately 260,000 homes.[41]

States such as North Dakota have benefitted from noteworthy success in the energy industry. Preliminary data from the U.S. Energy Information Administration indicates that North Dakota is one of the top 4 crude oil producing states in the U.S. attributable to developments in energy exploration technology. North Dakota is ranked in the top ten states for wind energy resources. [42] The energy industry in North Dakota has directly contributed to increased employment in state energy extraction and manufacturing to support the industry. As a result, the state continues to enjoy the lowest unemployment rate in the country. [43]

The international community has also demonstrated what is attainable through aggressively expanding energy access. Concerned with unpredictable oil prices and greenhouse gas emissions, foreign governments are pursuing domestic fossil fuel exploration and providing incentives to support the development of alternative energy. For example, Canada maintains growth in energy production resulting from domestic oil sands, making them one of the top five largest energy producers in the world and the largest energy supplier to the United States. [44]

Countries that are not endowed with vast energy resources like Canada are devoting efforts to renewable energy to improve economic growth and mitigate the risks of limited energy access. The European Union (EU) and member states have implemented policies to facilitate success in renewable energy. The European Union has an energy strategy to attain 20 percent of its energy from renewable sources.[45] Additionally, the EU is investing resources in the European Research Council which will seek and support innovative research in areas such as health, information technologies, security, and energy.[46]

Countries such as Germany have taken action to achieve EU goals. Germany's Energy Strategy seeks 60 percent of the country's total energy consumption from renewable sources by 2050. In 2011, renewable sources accounted for 11 percent of their final energy consumption. Germany predicts that renewable sources will account for 19 percent of their final energy consumption by 2020. The German government has implemented policies that encourage development and usage of alternative energy. [47] The efforts of Germany and other countries are driven by a desire to reduce reliance on foreign energy and the associated unpredictable pricing. Their approach, facilitated by

government-led efforts, reflects a commitment to insulate them from an energy crisis and bolster economic growth through energy jobs.

Options to Expand Energy Access

Government policies such as investment incentives and energy directives have played a role in expanding energy access. In the current fiscally constrained environment, Congressional support for continuing government-led efforts may be difficult. However, in order to reduce reliance on foreign oil, regardless of the source, and the potential threat reliance imposes on the American way of life; the federal government must continue to expand domestic access to energy. Relying solely on free markets to solve U.S. energy access places solutions in the hands of unpredictable market forces. The United States tried this approach in the 1980s and domestic production decreased while consumption increased. Energy access has national implication; therefore, it is a national issue that requires effective government involvement.

The President has highlighted the importance of energy within the National Security Strategy. One of the President's specific goals is to rely on clean energy for 80 percent of America's electricity by 2035.[48] He also recognizes the role of energy on the economy. Energy not only supports the basic necessities of life, but also can aid job creation. North Dakota's boom in jobs resulting from the energy industry provides proof. The Department of Energy (DoE) remains the lead agency to develop a strong national energy program to meet the present and future energy needs of the Nation.[49] The DoE has made limited progress in the last 35 years to improve access to energy. However, reliance on non-renewable energy, specifically oil, from other nations remains an issue. According to the Department of Energy 2011 Strategic Plan, more than 80% of total

U.S. energy and more than 95% of U.S. transportation fuel comes from fossil resources.[50] These percentages are not expected to change over the next 25 years. [51] Global energy consumption is expected to increase twice as quickly due to growing populations and the resulting need for energy. [52] If demand for foreign energy increases without a corresponding increase in supply, prices for energy and associated products will increase. Countries that provide energy, specifically oil, can affect the economies of nations in demand of energy.

History illustrates the impact of energy on military operations and the economy. The U.S. is positioned to continue leveraging technological advances to access domestic energy and reduce reliance on foreign oil. Several options can facilitate increased energy access. However, each option will require continued investment of resources and commitment of government leadership.

Option #1 Support Projected Efforts

According to the Environmental Information Agency, the United States is on a glide path to continue reducing dependence on foreign fossil fuels. Domestic production of oil will continue to increase during the next 25 years. [53] Projected domestic oil wells and recovery rates account for the estimated increase in oil production. Additionally, increased use of domestic biofuels and higher fuel standards will contribute to decreases in energy imports. Other energy sources such as natural gas, wind, solar, and hydropower are also contributing to increases in domestically produced energy, thereby helping to meet U.S. energy consumption requirements. Current investments in domestic oil and other energy sources can reduce U.S. dependence on foreign energy and improve the U.S. economy through job creation within the energy industry.

Current federal government budget requests identify requirements to continue domestic energy production and research. This highlights the commitment of government organizations to pursue domestic energy. More importantly, legislative leaders have publically advocated energy independence; therefore, Congressional support for investments in energy should be acceptable. Additionally, the current path of the United States to reduce reliance on foreign oil and achieve the Presidential energy goals is promising; however, current investment levels are part of a plan that requires another 20 years to complete.

Option #2 Increase Investments in Domestic Energy Access

Department of Energy projections indicate positive trends to reduce energy imports and expand domestic energy access.[54] Increasing current investments can accelerate America's ability to increase domestic energy. Technology is available to improve progress with additional funding. Alternative energy sources are providing power on military installations. Natural gas is positioned to provide the greatest contribution to U.S. energy sources. An increase in investment funding to support ongoing successes will not only expand domestic energy, but also increase the manufacturing base to support energy industry requirements, potentially creating more jobs. The Department of Energy predicts that the United States will become an exporter on natural gas during the next decade. Additional investment could expedite this prediction and ensure increased natural gas production is conducted in an environmentally safe manner.

The success of developing domestic energy coupled with increased investment will allow the U.S. to achieve the Presidential energy goals faster. In the ongoing fiscally constrained environment, requests for additional funding will be met with resistance

from Congress. The potential for the United States to become an exporter of natural gas sooner and the positive impact on domestic manufacturing may convince Congress to support additional funding. There are potential offsets for additional government investment in energy. Congress can consider the following funding sources: reduced spending in wasteful programs (this is always a challenge), reduced spending for unemployment benefits, if increased energy production and related manufacturing requirements generate jobs and a larger tax base from increased employment and manufacturing income.

Option #3 Pursue Multinational Cooperation

To reduce the reliance on foreign oil, many nations are also pursuing domestic energy sources. Some countries have achieved noteworthy success using non-fossil fuel energy sources or retrieving oil through new processes (i.e. Canada and Germany). The U.S. can increase cooperation with countries to leverage best practices in developing alternative energy. The International Renewable Energy Agency (IRENA) is an organization that facilitates knowledge sharing in alternative energy. The agency currently has over 100 countries as members, including the United States. Organizations like IRENA are facilitating alternative energy solutions.

This option will require increased interaction and knowledge sharing with international partners and perhaps additional investment funding to implement identified best practices. Increased coordination with international partners can provide solutions to domestic energy challenges. Given the limited natural resource of some countries, they may have innovative solutions to energy requirements that are applicable in the United States. If multinational cooperation requires significant additional investment, Congressional support for funding may be limited. As stated in option 2, legislative

leaders must consider potential funding offsets available to support the required investment.

International partners can also benefit from successes in U.S. domestic energy. They can leverage U.S. solutions and further reduce their reliance on foreign oil for energy which can have far reaching effects. Nations benefit from their ability to expand energy access through the production of domestic alternative energy. Countries become more capable of self-sustaining their way of life. This creates energy security and limits factors that can influence their economy (i.e. volatile foreign oil prices).

Based on the options addressed above, increased investment in domestic energy (option 2) applied with multinational cooperation (option 3) has the best potential to expand U.S. energy access quickly. Maintaining status quo support for ongoing efforts (option 1) does not require funding above requested levels and keeps the U.S. on the current glide path to increase domestic energy; however, reduction in foreign oil imports is gradual. Increased investment in domestic energy (option 2) can accelerate domestic energy access with additional funding. Multinational cooperation (option 3) leverages the best practices and ideas from other nations. Options 2 and 3 expand the availability of known energy solutions, build partnerships with other nations pursuing similar goals, and can insulate the U.S. from the affects of volatile foreign oil prices.

Proposed Strategy

The Department of Energy (DOE) continues to address U.S. energy needs and has supported efforts to expand energy access. However, several steps involving federal government leaders, Department of Energy, citizens, and businesses are required to increase American energy access through additional investment and multinational cooperation.

The first step is Presidential leadership to strengthen Congressional support for increased efforts to expand domestic energy access. Garnering funds from lower priority government requirements and potential savings from reduced unemployment payments (resulting from anticipated job creation generated by the energy industry) can provide the dollars required for increased investment in energy. Given Congress' role in funding and their commitment to domestic energy, gaining their support is necessary and achievable.

The 112th Congressional Committee on Energy and Commerce Oversight Plan included energy and environment issues that support increased energy access. The Committee focused on issues relating to national energy policy, including U.S. policies that related to production, supply, and consumption of electricity, oil and natural gas, coal, hydroelectric power, nuclear power and renewable energy.[55] The 113th Congressional Committee on Energy and Commerce must maintain the same focus to avoid losing momentum and repeating the stalled progress of the last three decades.

The American Recovery and Reinvestment Act provided $84.6 billion in new spending for the green energy sector as well as $21.6 billion in tax credits for energy, transport, and climate science.[56] Current government policies and investments are contributing to increases in domestic production of fossil fuels, biomass, and renewable energy through 2035. In the next decade, U.S. production of natural gas will be 5% greater than consumption allowing the U.S. to export excess.[57] As the Energy and Commerce Committee reviews how money is spent, they must focus their analysis and recommendations on how to continue progress and improve the return on investment and avoid cutting funds.

The Department of Energy plays an important role in the next step of the strategy, leveraging achievements in energy access. The Honorable Steven Chu, Secretary of Energy, defines the DOE as an integrator bringing together scientists from academia and the corporate sector to address complex challenges.[58] Dr. Chu believes his organization is positioned to drive science and engineering innovation to facilitate the transformation of the nation's energy system.[59] In this role, the Department of Energy should leverage energy solutions documented by the International Renewable Energy Agency (IRENA), specifically in the areas of renewable energy. Wind power production in the United States is expected to increase from 39 gigawatts in 2010 to 70 gigawatts in 2035.[60] The Department of Energy estimates that 60 gigawatts can power approximately 14 million homes.[61] The international community may have solutions that can further advance U.S. progress in wind power.

The Department of Energy should conduct a review of requirements in their FY14 – FY18 budget focusing on the feasibility of accelerating domestic energy projects. Additionally, DOE should identify best practices and advances in energy exploration, production, and distribution. The DOE, as an integrator, can then facilitate implementation of best practices or advances in the energy industry. An example for DOE consideration is the super wind turbine. One super wind turbine can produce 1 gigawatt, power for 750,000 homes.[62] When identifying best practices, DOE must also consider potential problems caused by pursuing alternate energy and identify solutions to mitigate problems.

The final step in the strategy is a national-level commitment by the public and industry to support broadened energy access. The solutions (e.g. domestic energy and

energy efficient products) facilitated by the DOE and resourced by Congress will require industry to execute and consumers to support through energy choices. Government leaders must conduct an information campaign to explain the national-level importance of aggressively pursuing increased energy access. The information campaign should highlight the potential threat to our way of life by continued reliance on foreign oil for energy. Additionally, the information campaign should highlight the economic benefits of increased energy access by citing successes throughout the United States. Continued individual and corporate energy tax credits will encourage support for alternative energy products and investment.

Actions by Congress, the Department of Energy, the public, and industry can generate a national level effort to increase domestic energy access. Oil prices remain volatile and continue to impact the U.S. economy. Increasing investments in domestic energy production can move the U.S. closer to energy independence. This strategy is feasible; though additional funding may be required if re-prioritized requirements do not provide sufficient funding for increased energy investments. This strategy is also acceptable and suitable since Congress supports domestic energy and the outlined strategy can increase U.S. energy.

Conclusion

The National Security Strategy acknowledges the importance of energy in security and economic growth. The DoD has taken action to improve military access to energy to support its role in security. The energy industry continues to support economic growth, evidenced in states like North Dakota. Historical examples reviewed

earlier illustrate the effect of energy on military operations (e.g. Hitler's push to the Caspian Sea) and the American economy (e.g. 1973 OPEC oil embargo).

A comprehensive approach (involving leadership, investment, and commitment) is required to leverage successes in expanding domestic energy access. The approach includes the federal government, industry, and consumers to facilitate the growth and efficient use of domestic energy. America loss momentum in the 1980s as energy access was not threatened. The United States must not accept current gains in domestic energy as good enough. Waiting for the next energy crisis to find solutions is not the best use of time and adversely affects the American way of life. The U.S. has reduced reliance on oil from the Middle East, but has the potential to further reduce reliance on foreign oil through domestic energy.

Endnotes

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